Society for Integrative and Comparative Biology

2015 Annual Meeting

Meeting Abstract

14.2 Sunday, Jan. 4 10:30 **3D surface-based morphometrics used to determine the intraspecific differences within the tail of syngnathid fishes** *NEUTENS, C; DE DOBBELAER, B; CLAES, P; ADRIAENS, D*; Ghent University; Catholic University Leuven; Catholic University Leuven; Ghent University* dominique.adriaens@ugent.be http://www.fun-morph.ugent.be

Seahorses and pipehorses both possess a prehensile tail, a unique characteristic among teleost fishes, allowing them to grasp and hold onto substrates, like sea grasses. Pipefishes, representing the ancestral condition, have a rather rigid tail. The tail of all these syngnathid fishes is characterized by a vertebral column that is surrounded with dermal plates – four per vertebra. The goal of this study is to determine the relation between the differences in plate and vertebral morphology and the flexibility of the tail. To do so, a 3D morphometrical analysis based on surface meshes generated based on µCT-scans was performed, followed by a PC analysis and a scree plot with broken stick analysis. Four different analyses were applied on the tail of nine different species (four pipehorses, two seahorses, one pipefish and one seadragon): (1) a comparison between the proximal and distal vertebrae, (2+3) a comparison between the proximal and distal ventral resp. dorsal plates and (4) a comparison between both the dorsal and ventral dermal plates. For the analysis on the vertebrae, the main differences could be found in the length and orientation of the parapophyses and the neural and hemal spines in all species, as well as the inclination angle of the vertebral body in species with a prehensile tail. The main difference between the proximal and distal dermal plates in prehensile tails is the overall shape of the plates, which changes from rectangular to square. The analysis comparing the ventral and dorsal dermal plates showed significant differences between both in all studied species. Overall, a higher intraspecific variation is observed in species with a prehensile tail.